

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of producing a polymer in a continuously operated gas phase reactor, comprising:

- polymerizing at least one monomer in a bed containing active catalyst formed by catalyst and polymer particles suspended in a fluid, said bed defining a fluidized bed level in said reactor,
- continuously withdrawing polymer powder from the reactor through a first outlet nozzle located at a point above a fluidization plate where no lumps are present;
- adjusting a discharge rate of the polymer powder so as to maintain a constant bed level during polymerization; and
- separately recovering particle agglomerates from the reactor by discontinuously withdrawing the particle agglomerates ~~through a second outlet nozzle located at the same level as the fluidized bed,~~

wherein the discharge rate of the polymer powder is adjusted by using a continuously operated control valve, and the operation of the control valve is adjusted by using a control signal obtained from a bed level controller,

wherein the control valve is adjusted to provide for pulsating operation to prevent clogging of the valve, [[and]]

wherein the ratio between the polymer powder continuously discharged from the reactor and the polymer particle agglomerates discontinuously withdrawn is in the range of 1:1 to 10,000:1,

wherein a gas is returned into the gas phase reactor at a point above the level of the fluidized bed, and

wherein recovered lumps are withdrawn from a collecting vessel through a second outlet nozzle.

2. (Canceled)

3. (Previously Presented) The method according to claim 1, wherein the continuously operated valve is a ball valve, a V-ball valve or a hose valve.

4. (Previously Presented) The method according to claim 3, wherein the first outlet nozzle is connected to the control valve, and is provided with a grid flush mounted at the reactor wall to prevent lumps from entering the pipe.

5. (Canceled)

6. (Canceled)

7. (Previously Presented) The method according to claim 1, wherein polymer powder is continuously withdrawn from a point above a fluidization plate.

8. (Previously Presented) The method according to claim 1, wherein polymer powder is continuously withdrawn from a point below the bed level.

9. (Previously Presented) The method according to claim 1, wherein the discharge line and the control valve are discontinuously backflushed with a flushing gas flow.

10. (Previously Presented) The method according to claim 1, further comprising
- using a gas phase reactor having a mechanically mixed zone of the fluidized bed, and
 - continuously withdrawing the polymer powder from said mixed zone.

11. (Previously Presented) The method according to claim 1, wherein polymer powder is also separately withdrawn from the reactor using a discontinuous discharge device.

12. (Previously Presented) The method according to claim 1, wherein the polymer powder is withdrawn together with gas from the reactor, the gas is separated from the polymer powder, and the separated gas is recycled into the reactor.

13. (Currently Amended) A method of producing a polymer in a continuously operated gas phase reactor, comprising:

- polymerizing at least one monomer in a bed containing active catalyst formed by catalyst and polymer particles suspended in a fluid, said bed defining a fluidized bed level in said reactor,

- continuously withdrawing polymer powder from the reactor through a first outlet nozzle ~~located at a point above a fluidization plate where no lumps are present;~~
- adjusting a discharge rate of the polymer powder so as to maintain a constant bed level during polymerization; and
- withdrawing particle agglomerates from the reactor ~~through a second outlet nozzle located at the same level as the fluidized bed~~ with a discontinuously operated discharge valve;

wherein the discharge rate of the polymer powder is adjusted by using a continuously operated control valve, and the operation of the control valve is adjusted by using a control signal obtained from a bed level controller, [[and]]

wherein the ratio between the polymer powder continuously discharged from the reactor and the polymer particle agglomerates discontinuously withdrawn is in the range of 1:1 to 10,000:1,

wherein a gas is returned into the gas phase reactor at a point above the level of the fluidized bed, and

wherein recovered lumps are withdrawn from a collecting vessel through a second outlet nozzle.

14. (Currently Amended) A method of discharging polymer from a continuously operated gas phase reactor, wherein at least one monomer is polymerized in a bed containing active catalyst formed by catalyst and polymer particles suspended in a fluid, said bed defining a fluidized bed level in said reactor, comprising:

- continuously withdrawing polymer powder from the reactor through a first outlet nozzle ~~located at a point above a fluidization plate where no lumps are present;~~
- feeding the withdrawn polymer powder into a collecting vessel, wherein lumps are separated from finely-divided polymer powder ~~through a second outlet nozzle located at the same level as the fluidized bed~~ and at least a part of the gas is separated from the solid material;
- recovering the lumps; and
- adjusting a discharge rate of the polymer powder so as to maintain a constant bed level during polymerization, wherein the discharge rate of the polymer powder is adjusted by using a continuously operated control valve, and the operation of the control valve is adjusted by using a control signal obtained from a bed level controller,

wherein a gas is returned into the gas phase reactor at a point above the level of the fluidized bed, and recovered lumps are withdrawn from a collecting vessel through a second outlet nozzle.

15. (Original) The method according to claim 14, wherein the separated gas is recycled into the reactor, said collecting vessel being provided with a return valve for adjusting the gas flow recycled to the reactor.

16. (Original) The method according to claim 15, wherein the return valve is controlled by the fluidized bed level of the reactor.

17. (Original) The method according to claim 16, wherein the polymer level in the vessel is controlled by using a continuously operating control valve.

18. (Original) The method according to any of claims 14 to 17, wherein the collecting vessel is provided with a screen for separating lumps.

19. (Previously Presented) The method according to claim 1, wherein the catalyst is fed into the gas phase reactor as a stream comprising polymer and active catalyst together with reaction medium.

20. (Original) The method according to claim 19, wherein the catalyst is fed into the gas phase reactor from a slurry reactor.

21. (Original) The method according to claim 20, wherein the slurry reactor is a loop reactor.

22. (Previously Presented) The method according to claim 1, wherein the monomers are selected from the group of C₂ to C₁₆ olefins and mixtures thereof.

23. (Previously Presented) The method according to claim 1, wherein the monomer is selected from the group of ethylene, propylene, 1-butene, 4-methyl-1-pentene, 1-hexene, dienes, and cyclic olefins, and mixtures thereof.

24. (Previously Presented) The method according to claim 1, wherein the polymer that is continuously withdrawn is either directly or indirectly fed into another gas phase reactor.

25. (Previously Presented) The method according to claim 14, wherein the collecting vessel is connected to a gas separator, said polymer powder being pneumatically conducted from the collecting vessel to the gas separator.

26-28. (Canceled)

29. (Currently Amended) A method of producing a polymer in a continuously operated gas phase reactor, comprising:

- polymerizing at least one monomer in a bed containing active catalyst formed by catalyst and polymer particles suspended in a fluid, said bed defining a fluidized bed level in said reactor,
- continuously withdrawing polymer powder from the reactor through a first outlet nozzle located at a point above a fluidization plate where no lumps are present;
- adjusting a discharge rate of the polymer powder so as to maintain a constant bed level during polymerization; and
- withdrawing particle agglomerates from the reactor through a second outlet nozzle located at the same level as the fluidized bed;

wherein the discharge rate of the polymer powder is adjusted by using a continuously operated control valve, said operation of the control valve is adjusted by using a control signal obtained from a bed level controller, and

wherein the ratio between the polymer powder continuously discharged from the reactor and the polymer particle agglomerates discontinuously withdrawn is in the range of 1:1 to 10,000:1.

30. (Canceled)

31. (Previously Presented) The method according to claim 1, wherein the step of separately recovering the particle agglomerates from the reactor is accomplished by using an outlet located near a level of a distributor plate.

32. (Previously Presented) The method according to claim 1, further comprising a step of degassing the polymer powder withdrawn from the reactor,
wherein the polymer powder is free-flowing powder.

33. (Currently Amended) A method of producing a polymer in a continuously operated gas phase reactor, comprising:

- polymerizing at least one monomer in a bed containing active catalyst formed by catalyst and polymer particles suspended in a fluid, said bed defining a fluidized bed level in said reactor,

- continuously withdrawing polymer powder from the reactor through a first outlet nozzle ~~located at a point above a fluidization plate where no lumps are present;~~
- adjusting a discharge rate of the polymer powder so as to maintain a constant bed level during polymerization; and
- separately recovering particle agglomerates from the reactor by discontinuously withdrawing the particle agglomerates ~~through a second outlet nozzle located at the same level as the fluidized bed,~~

wherein the discharge rate of the polymer powder is adjusted by using a continuously operated control valve, and the operation of the control valve is adjusted by using a control signal obtained from a bed level controller, [[and]]

wherein the first outlet nozzle is connected to the control valve, and is provided with a grid flush mounted at the reactor wall to prevent lumps from entering the pipe, [[and]]

wherein the ratio between the polymer powder continuously discharged from the reactor and the polymer particle agglomerates discontinuously withdrawn is in the range of 1:1 to 10,000:1, and

wherein a gas is returned into the gas phase reactor at a point above the level of the fluidized bed, and recovered lumps are withdrawn from a collecting vessel through a second outlet nozzle.

34. (Previously Presented) The process according to claim 1, wherein the first outlet nozzle and the second outlet nozzle are directly connected to a connecting tank which receives all the agglomerates and polymer from the fluidized bed reactor.